UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/542,493	04/24/2006	David Strand	005092.00076	5291

22910 7590 07/07/2010

BANNER & WITCOFF, LTD.
28 STATE STREET
SUITE 1800
BOSTON, MA 02109-1701

EXAMINER	
KAUR, GURPREET	
ART UNIT	PAPER NUMBER
1795	

MAIL DATE	DELIVERY MODE
07/07/2010	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/542,493	STRAND ET AL.	
	Examiner	Art Unit	
	GURPREET KAUR	1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *09 April 2010*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *3 and 20-42* is/are pending in the application.

4a) Of the above claim(s) *3 and 36-38* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *20-35 and 39-42* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Status of the Claims

1. Claims 3 and 20-42 are pending in the application.

Claims 3, and 36-38 are withdrawn and 1, 2, 4-19 and 42-97 are cancelled.

Status of the Rejection

2. Previous rejection is withdrawn in light of applicant's arguments.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. Claim 20, 22, 29-32, 35, 39 and 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mazzeo et al. (Capillary isoelectric focusing of proteins in uncoated fused-silica capillaries using polymeric additives, Anal. Chem. 1991,

63, 2852-2857) in view of Luner et al. (U.S. Pat. No. 3,664,939) and Witt et al. (U.S. Pat. No. 7,118,660).

Regarding claim 20, Mazzeo et al. teaches the method of isoelectric focusing and mobilizing a focused pattern of protein zones (see page 2853 col. 2, paragraph Hemoglobin Analaysis) comprising:

hemoglobin (charge analyte) dissolved in pharmalyte with methyl cellulose which inherently minimize the EOF (see page 2853 col. 2, paragraph 2), thus hemoglobin is focused in flowing liquid under electric field gradient to form a focused discrete zone (see page 2853 col. 2, paragraph Hemoglobin Analaysis);

changing the pH of the catholyte to mobilize the analyte band under applied voltage (see page 2853 col. 2, paragraph Hemoglobin Analaysis);

detecting the mobilized bands with the detector (see page 2853 col. 2, paragraph Hemoglobin Analaysis).

Mazzeo et al. teaches detecting the position of the bands as they elute out as indicated in figure 2 to determine the corresponding analyte to known pI values but does not specifically indicate determining the isoelectric point based on the pH of the flowing liquid and position data.

However, it is well known in the art of isoelectric focusing that isoelectric point of the protein or charged particle is the pH of the liquid where the net electrical charge of the protein is zero and that is isoelectric point of the protein.

Moreover, Luner et al. teaches the method of determining the pH value of the liquid to determine the isoelectric point of the proteins (see abstract and col. 2, lines 17-21 and col. 1, lines 29-40). Furthermore, Witt et al. teaches isoelectric

focusing method wherein the measuring the speed in time of the separated bands at the point of detection allows to derive the information about the isoelectric point (see col. 5, lines 33-41).

Therefore it would be obvious to person of ordinary skill in the art at the time of the invention to incorporate both the steps of Luner et al. and Witt together with the method of Mazzeo et al. to determine the isoelectric point because both the steps upon combining will provide more accurate determination of the isoelectric point wherein both the steps from Luner and Witt will provide information about the isoelectric point of the protein (see Luner , col. lines 17-21 and col. 1, lines 29-40 and col. 5, lines 33-41).

4. Regarding claim 22, Mazzeo indicates changing the catholyte with the salt which would inherently change the pH of the catholyte (see page 2853 col. 2, paragraph Hemoglobin Analaysis). Mazzeo does not explicitly indicate if the pH is incremented above or below the isoelectric point. However, it would be obvious to increment the pH accordingly to move the charged analyte. Furthermore, Mazzeo indicates Hjerten teaching of salt mobilization wherein Hjerten teaches varying the pH of either the anolyte or catholyte such that both have pH's above or below the isoelectric point of the substance to be mobilized (see page 2853 col. 1, paragraph 2).

5. Regarding claims 29, 30 and 32, Mazzeo et al. teaches charged analyte is a hemoglobin (biomarcromolecule) (see page 2853 col. 2, paragraph

Hemoglobin Analaysis) and hemoglobin is inherently has multiple charged analytes.

6. Regarding claim 31, Witt et al. teaches DNA analysis can also be formed (see col. 4, lines 1-3).

7. Regarding claim 35, Mazzeo teaches mobilization is performed by changing the catholyte of 40mM arginine of know concentration with known concentration of titration liquid 50mM Na_2HPO_4 (see page 2853 col. 2, paragraph Hemoglobin Analysis).

8. Regarding claims 39 and 40, Mazzeo et al. teaches proteins are focused under electric field gradient focusing (EFGF) in a pharmalyte with methyl cellulose and then mobilized the focused bands of proteins (see page 2853 col. 2, paragraph Hemoglobin Analaysis). It is obvious to person of ordinary skill in the art EFGF occurs in a capillary (chamber).

9. Claims 21, 24, 26, and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mazzeo, Luner, Witt et al, and further in view of Yang et al. (U.S. Pat. No. 4,666,855).

Regarding claim 21, Mazzeo et al. in view of Luner et al. and Witt et al. does not teach isoelectric point is determined by extrapolation.

However, Yang et al. teaches the method of determining isoelectric point of an amphoteric molecule comprising (see col. 3, lines13-16) the step of extrapolating the profile to determine the isoelectric point which are in excellent agreement with the literature value (see col. 10, lines 10-15).

Therefore it would be obvious to person of ordinary skill in the art at the time of the invention to incorporate the extrapolating step of Yang et al. with the method of Mazzeo because extrapolating step provided excellent isoelectric point value when compared with literature value (see Yang, col. 10, lines 10-15).

10. Regarding claims 24 and 26, Mazzeo does teach changing the pH of the catholyte with the Na_2HPO_4 (see page 2853 col. 2, paragraph Hemoglobin Analaysis).

Mazzeo in view of Luner et al. and Witt et al. does not teach pH of the flowing liquid is changed in increments and isoelectric point is calculated by averaging the upper bracket pH and lower bracket pH.

However Yang et al. teach the method of determining the isoelectric point of an amphoteric molecule (see col. 3, lines 13-16) comprising the step of changing (incrementing) the pH above of the isoelectric point to the below of the isoelectric point to obtain higher and lower plateau (see figure 1) and isoelectric point is determined by averaging the higher and lower bracketing absorbance at the corresponding pH (see Table 1).

Therefore it would be obvious to person of ordinary skill in the art at the time of the invention to incorporate the method of determining the isoelectric

point of Yang et al. with the Mazzeo method allows to calculate the isoelectric point in any type of buffer system (see Yang, col. 4, lines 17-19).

11. Regarding claim 33, Mazzeo et al. teaches a UV detector to detect the bands (see page 2853 col. 2, paragraph Hemoglobin Analaysis and figure 2).

12. Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mazzeo, Luner, Witt and further in view of Malabarba et al. (U.S. Pat. No. 5,521,155).

Regarding claim 23, Mazzeo et al. in view of Luner et al. and Witt et al. does not teach that isoelectric point is determined by interpolation.

However, Malabarba et al. teaches that isoelectric point of each antibiotic was determined by interpolation on a curve (see col. 51, lines 35-45).

Therefore it would be obvious to person of ordinary skill in the art at the time of the invention to include the interpolation step of Malabarba et al. with the Mazzeo method because interpolation method is known to be used to determine isoelectric point (see Malabarba col. 51, lines 35-45).

13. Claim 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mazzeo, Luner, Witt and further in view of Zhu et al. (U.S. Pat. No. 5,110,434).

Regarding claim 25, Mazzeo does teach changing the pH of the catholyte.

Mazzeo et al. in view of Luner et al. and Witt et al. are silent to titrating the anolyte or catholyte with dialyzing ions.

However, Zhu et al. teaches titrating the anolyte and catholyte with zwitterions (dialyzing ions) to a fixed pH (see col. 5, lines 20-34 and 39-44).

Therefore it would be obvious to person of ordinary skill in the art at the time of the invention to incorporate the zwitterions mobilization method of Zhu et al. with Mazzeo method because zwitterions mobilization method provides continuous expanding zone in the medium which prevents broadening of late-migrating and slow-moving peaks (see Zhu, col. 2, lines 50-53 and 28-30).

14. Claims 27 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mazzeo, Luner, Witt and further in view of Ivory et al. (U.S. Pat. No. 6,277,258).

Regarding claim 27, Mazzeo et al. in view of Luner et al. and Witt et al. does not teach charged analyte is first focused in a DFGF chamber.

However, Ivory et al. teaches method of focusing a charged solute (see abstract) wherein the charged solute is focused in DFGF chamber (10) (see col.13, lines 20-23), focusing in DFGF chamber provides proteins being focused away from their isoelectric point thus avoiding the precipitates that often form near the isoelectric point (see col. 13, lines 55-62).

Therefore it would be obvious to person of ordinary skill in the art at the time of the invention to incorporate the step of focusing the charged solute in DFGF chamber of Ivory et al. with the Mazzeo et al. method because the step provides proteins being focused away from their isoelectric point thus avoiding

the precipitates that often form near the isoelectric point (see Ivory, col. 13, lines 55-62).

15. Regarding claim 28, Ivory et al. teaches that DFGF chamber comprises a separation chamber (12) (see figure 1) which comprises chromatography media (see col. 9, lines 5-16) and under applied electric field gradient the protein bands focused, separated and eluted from the device (see col. 7, lines 1-7).

16. Claim 34 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mazzeo, Luner, Witt and further in view of Ness et al. (U.S. Pat. No. 6,613,508).

Regarding claim 34, Mazzeo et al. in view of Luner et al. and Witt et al. does not specifically indicated the sample is split before being focused and incremented.

However, Ness et al. teaches the sample splitter which splits the sample into fractions for further analysis or storage (see col. 84, lines 18-23).

Moreover, it is obvious to person of ordinary skill in the art to spilt sample into smaller volume to perform analysis at faster rate.

Therefore it would be obvious to person of ordinary skill in the art at the time of the invention to incorporate the sample splitter to split the sample of Ness et al. with the Mazzeo method because splitting the sample into fractions for analysis can be done at faster rate.

17. Claims 41 and 42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mazzeo, Luner, Witt and further in view of Ivory et al. (U.S. Pat. No. 6,277,258).

Regarding claims 41 and 42, Mazzeo et al. in view of Luner et al. and Witt et al. does not specifically indicated that EFGF chamber comprises a configured electrode chamber and a separation chamber.

However, Ivory et al. teaches method of focusing a charged solute (see abstract) under electric field gradient (see col. 5, lines 35-39 and 59-61) wherein the charged solute is focused in device (10) comprised of configured electrode chamber (14) and separation chamber (12) (see figure 1).

Therefore it would be obvious to person of ordinary skill in the art at the time of the invention to incorporate configured electrode chamber and separation chamber of Ivory et al. with the Mazzeo method because the configured chambers provides a compact and portable assembly.

Response to Arguments

Applicant's arguments, see pages 7-9, filed 4/9/2010, with respect to claim 20 have been fully considered and are persuasive. The rejection of claim 1 has been withdrawn.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to GURPREET KAUR whose telephone number is (571)270-7895. The examiner can normally be reached on Monday-Friday (Alternate Friday Off), 8:00-5pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen can be reached on (571)272-1342. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Nam X Nguyen/
Supervisory Patent Examiner, Art Unit 1753

/G. K./
Examiner, Art Unit 1795
7/2/2010